

OXIDATION RESISTANT SINGLE CRYSTAL SUPERALLOY CASTINGS

Patent Number: WO9324683
Publication date: 1993-12-09
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Requested Patent: ☐ WO9324683
Application Number: WO1993US03803 19930422
Priority Number(s): US19920889581 19920528
IPC Classification: C30B29/52 ; C22C19/05
EC Classification: C22C19/05P5, C22C19/05P6, C30B11/00
Equivalents:

Abstract

Single crystal superalloy castings are described which have excellent oxidation resistance. The oxidation resistance is due to the presence of small but effective amounts of magnesium in the casting. Single crystal castings containing magnesium in the range of 5-200 parts per million, by weight, are described. Up to 100 % of the magnesium could be substituted by an equal atomic percent of calcium. The superalloy further consists essentially of, by weight percent, 1-12 chromium, 2-12 cobalt, 0-2.5 molybdenum, 3-10 tungsten, 0-8 rhodium, 2.5-13 tantalum, 0-2 titanium, 4.5-6.5 aluminum, 0-0.5 hafnium, 0-0.1 carbon, 0.0005-0.0200 magnesium, remainder nickel.

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Re 0-8
Al 4.5-6.5
W 3-10
Cr 1-12
Co 2-12
Hf 0.-0.5
Mo 0-2.5
Ta 2.5-13
Ti 0-2